COST ESTIMATION FOR I-69 EVANSVILLE TO INDIANAPOLIS ALTERNATIVES

1.0 INTRODUCTION

To estimate costs for the I-69 Evansville to Indianapolis Tier 1 Alternatives, several Excel spreadsheets were created and linked to each other. This permitted related data and estimate consistency among spreadsheets. For example, if a unit cost changed, it was changed in only one location, and the information in all corresponding sheets was automatically updated. This eliminated many possible sources of error. In addition, the use of these linked spreadsheets ensured that all alternatives were compared on an equal basis and that “like construction” had similar cost irrespective of the alternative being studied. This ensured an “apples to apples” comparison of construction cost between alternatives.

Section 2, Cost Methodology, documents the procedures employed in determining the various costs for the components of highway construction. A series of linked spreadsheets used these derived costs to estimate construction costs for each route concept and ultimately the costs involved with the Alternatives presented in the Draft Environmental Impact Statement (DEIS). Following the comment period on the DEIS, refinements were made and final selection of the preferred route was made. Further refinements were made in the selection of the preferred variation within an alternative (e.g. around Washington). Although, the same methodology of cost estimation was used in the Final Environmental Impact Statement (FEIS), there were adjustments made for modified grade separation locations, and refined costs at select interchanges. In addition, costs for design engineering was updated to reflect the new construction costs and right-of-way engineering and services costs were applied to the latest right-of-way cost. The costs associated with mitigation and rest areas have also been included as separate line items.

Section 3 addresses costs that were not included in the Tier 1 Study but will be included in the Tier 2 studies. Section 4 addresses the proposed methodology to be used in Tier 2 studies to estimate costs. Finally, maps of the alternatives and accompanying cost summary tables are included.

2.0 COST METHODOLOGY

Cost.xls is a spreadsheet consisting of unit prices for each item. This spreadsheet is the basis for all the cost estimating work that follows as all templates are linked to this spreadsheet. The unit prices used in *"Cost.xls"* have been obtained from various sources. The basic spreadsheet was copied from a "Pre-engineering Cost Parameters General Guidelines" compiled by the Indiana Department of Transportation (INDOT) and dated 1/16/97. This report was developed by compiling the average unit costs from the bid history of selected awarded contracts for major items (pavement, traffic control, etc.) during the years 1994 through 1996 for similar projects. Also some items listed were the result of interviews held with design experts in those areas (i.e. bridge rehabilitation, signal, sign and lighting, right-of-way, etc) to develop reasonable parametric costs. This report represented the most recent published data by INDOT for the estimation of costs of construction during the planning/environmental/engineer's report phase.

This data was updated to reflect anticipated costs at the time of publication (1/6/97). These guidelines served as the starting point in the development of "Cost.xls" in the year 2000. The Producer Price Index for Highway and Street Construction (PPI) changed from 124.6 to 126.5 (or a total of 1.52%) between January 1997 and January 1999. This reflected the change in construction costs experienced from 1997 to 1999. The cost information was developed in year 2000 and at the time the information on producer price index (inflation) was not available beyond 1999. To account for this change, these costs were adjusted by 1.52% to obtain costs for 1999. Since publication of the DEIS, the producer price index increased about 7.8% between 1999 and 2000. Further investigation of this trend found that the producer price index had increased by a total of 8.2% between 1999 and 2001. As will be seen in the discussion below, very few items were used from this updated report. They tended to be minor items and the variation caused by the producer price index (PPI) effects was not significant when compared to the total cost of construction. Construction costs for Preferred Alternative 3C were investigated to see the effect of bringing these select items to year 2000 cost (based on a 7.8% increase in PPI). The result was an increase in total construction cost of only 0.18%. Consequently, no effort has been made to further refine the cost of these minor items.

The remainder of the item costs needed to complete cost estimates within each segment were hand-calculated. Unit prices used for these hand-calculations are from American Association of State Highway and Transportation Officials' (AASHTO) Trns-port Estimator program. Other hand-calculated unit costs were used from previous studies as guides to determine estimated costs for particular locations or types of work. The two major items of cost, namely earthwork and pavement were computed by use of this prior work. The computed values of pavement and earthwork quantities along with their relevant pay item descriptions were used with year 2000 unit prices from the Trns-port Estimator program. These components together were significantly higher than the per mile costs derived from the "Pre-engineering Cost Parameters General Guidelines" for a four-lane rural Interstate highway and thus were used.

In conclusion the cost estimating template used a combination of sources. For minor items, costs derived from "Pre-engineering Cost Parameters General Guidelines" (converted to 1999 dollars) was used with no further refinement deemed necessary. For the major items such as pavement and earthwork, etc. computed information and used to derive the cost. This ensured that the best available data was used. Because of this approach, it was not felt that there were any significant gaps in the cost and thus a contingency was not added. This enabled a direct comparison of costs between alternatives.

Following is a summary of methodologies used to estimate all unit costs used to calculate the alternative cost estimates.

2.1 ROADWAY COSTS

2.1.1 MAINLINE PAVEMENT

The unit costs were incorporated into the mainline pavement per mile cost: 1) 13 inches of QC/QA plain cement concrete pavement; 2) 7 inches of subbase for cement concrete pavement; 3) 12 inches of compacted aggregate; 4) D-1 construction joints; and 5) concrete median barrier (for urban sections only). The unit cost for each of these components was obtained from the American Association of State Highway and Transportation Officials' (AASHTO) Trns-port Estimator program (for year 2000). Since the cost estimation program applies the full depth concrete pavement section to the traffic lanes and the paved portion of the shoulders, the resulting cost estimates are conservatively high. During Tier 2 studies more definitive pavement quantities will be developed and the actual section of the shoulder will be used rather than applying the thicker travel lane pavement section. By utilizing these unit costs, a per mile cost was established for the following scenarios:

1) Rural, four-lane segment with 12 ft lanes, 11 ft outside shoulders [10 ft paved], 4 ft inside shoulders, and a 80 ft grass median (60 ft grass median representing use of an existing four-lane divided highway such as US 41 and SR 37).

2) Rural, six-lane segment with 12 ft lanes, 12 ft outside shoulders [10 ft paved], 10 ft inside shoulders, and a 80 ft grass median (60 ft grass median representing use of an existing four-lane divided highway such as US 41 and SR 37).

3) Urban, four-lane segment with 12 ft lanes, 12 ft outside shoulders [12 ft paved], 26 ft inside shoulders [12 ft paved], and a concrete median barrier. An additional 2 feet of pavement is provided beyond the outside shoulder to provide enough room for future maintenance of traffic needs between the median barrier and the outside barrier.

4) Urban, six-lane segment with 12 ft lanes, 14 ft outside shoulders [14 ft paved], 26 ft inside shoulders [12 ft paved], and a concrete median barrier. An additional 2 feet of pavement is provided beyond the outside shoulder to provide enough room for future maintenance of traffic needs between the median barrier and the outside barrier.

5) Urban, eight-lane segment with 12 ft lanes, 14 ft outside shoulders [14 ft paved], 26 ft inside shoulders [12 ft paved], and a concrete median barrier. An additional 2 feet of pavement is

provided beyond the outside shoulder to provide enough room for future maintenance of traffic needs between the median barrier and the outside barrier.

"Cost.xls" was modified to reflect the above scenarios to calculate costs for the pavement so that earthwork (a direct function of terrain) could be applied separately. The per mile costs for new road construction contained in the "Pre-engineering Cost Parameters General Guidelines" were not used in the calculations but served only as a basis of comparison for the reasonableness of the computed costs. The costs used are displayed in a table at the end of Section 2.3.

2.1.2 EARTHWORK

The following unit costs were incorporated into the earthwork per mile cost: 1) common excavation; 2) borrow; and 3) rock excavation. The unit cost for each of these components was obtained from the aforementioned Trns-port Estimator program (for year 2000). The amount (in cubic yards) per mile for each of these components was determined by taking an average from the 1996 Southwest Highway Draft EIS (preferred alignment) per mile quantities for the following types of terrains: 1) flat (level); 2) rolling, with solely common excavation; 3) rolling with common as well as rock excavation; and 4) hilly. These values were determined by use of a digital terrain model to establish the base condition off USGS contour maps. Then a roadway profile was determined. A cross section template was used with this proposed roadway profile to get a series of cross sections showing the proposed as well as the existing ground line. From that quantities of cut and fill were determined. By utilizing these per mile quantities of earthwork and the available unit prices from Trns-port Estimator program (for year 2000) as well as a judgment on the level of precision, a per mile cost was established for the four (4) different types of terrains. The terrain type for each segment was determined from knowledge of the topography, field reviews of the corridor, and engineering judgment using USGS 7.5 minute topographic quadrangle maps. Since pavement and earthwork make up the major components of roadway costs, it was decided to treat these two separately from the all inclusive per mile costs contained in the "Pre-engineering Cost Parameters General Guidelines". It is believed that basing the earthwork on terrain type and developing segments where pavement requirements and terrain type are known can lead to a better-defined cost. The costs used are displayed in a table at the end of Section 2.3.

2.1.3 ADDITIONAL EARTHWORK FOR ELEVATED INTERSTATE

The cost for Structural Backfill was the only cost used to determine the additional earthwork per mile cost to elevate the Interstate. The height of fill was assumed to be 15 ft. The unit cost for the Structural Backfill was obtained from the Trns-port Estimator program. By utilizing the computed volume of structural backfill per mile for the following scenarios: 1) elevated four-lane Interstate, 100 ft width; and 2) elevated six-lane Interstate 124 ft width; 3) elevated eight-lane Interstate 148 ft width and the unit price, a per mile cost was established. The costs used are displayed in a table at the end of Section 2.3.

2.1.4 MAINTENANCE OF TRAFFIC

The following costs were incorporated into the maintenance of traffic per mile cost: 1) temporary cross over, type "B"; 2) two-way traffic with temporary concrete median barrier and strengthened shoulders; and 3) two-way traffic with temporary concrete median barrier. The unit cost for the first two components was taken from the January 16, 1997 edition of the "Pre-engineering Cost Parameters General Guidelines", multiplied by a factor to convert the unit prices to 1999 dollars; the unit cost for the third component was obtained from the Trns-port Estimator program (for year 2000). By utilizing these unit costs, a per mile cost was established for maintenance of traffic. This cost was only applied to those segments which utilized existing roadways, if a segment was to be constructed through new terrain, the per mile maintenance of traffic cost was assumed to be negligible. The costs used are displayed in a table at the end of Section 2.3.

2.1.5 SIGNING AND LIGHTING

The per mile cost for signing and lighting utilized in this study was obtained through the use of engineering judgment as well as an average cost for signing and lighting from previous projects. The costs used are displayed in a table at the end of Section 2.3.

2.1.6 ADDITIONAL (MISCELLANEOUS) ROAD COSTS

Two types of costs for local road improvements were estimated: 1) cost for road approaches for a grade separation (county road over Interstate only); and 2) cost for new frontage or access roads on the local road network. For the former, 0.5 miles of new roadway per grade separation was assumed; for the latter, scaling off of USGS topographic quadrangle or aerial maps was used to determine the length of roadway needed. The same unit cost, obtained from engineering judgment as well as from previous projects involving county roads, was used for both cases of local road improvements.

The unit cost of constructing mechanically stabilized earth (MSE) walls was taken from the aforementioned INDOT General Guidelines (converted to 1999 dollars). The walls were assumed to be 15 ft (5 m) high, with a 1,000 ft (305 m) taper at the beginning and end of the elevated section. Two walls (one on each side of the roadway) were assumed for each elevated section of the Interstate in areas where the Interstate would be elevated to provide grade separation over cross roads. The unit cost of constructing the leveling pads for the mechanically stabilized earth (MSE) walls was taken from the Trns-port Estimator program (for year 2000).

The costs used for these miscellaneous road costs are displayed in a table at the end of Section 2.3.

2.1.7 MAINLINE REMOVAL

The unit cost for (concrete) pavement removal was taken from the Trns-port Estimator program (for year 2000). This category was only used when the Interstate was to be constructed over an existing major state or U.S. highway (e.g. U.S. 41 or S.R. 37). It was assumed that one half of the roadway along the segment was constructed with concrete, thereby requiring this cost to be included.

The unit cost for bridge removal was obtained from the aforementioned INDOT General Guidelines (converted to 1999 dollars). Three categories were established for bridges of different ranges of length: 1) bridges with a length less than 49 ft; 2) bridges with a length greater than 49 ft, but less than 98 ft; and 3) bridges with a length greater than 98 ft, but less than 148 ft. If a bridge length was longer than 148 ft, the length was divided by 148 and the answer was rounded down to the nearest tenth to obtain the equivalent number of bridges to be removed with a length between 98 and 148 ft.

The mainline removal costs used are displayed in a table at the end of Section 2.3.

2.2 INTERCHANGE COSTS

2.2.1 INTERCHANGE PAVEMENT AND EARTHWORK

The unit cost for the pavement for the different types of interchanges was obtained by calculating an average cost from INDOT's Mini-Scope Cost Estimate & Environmental Overview for S.R. 69 along U.S. 41, S.R. 641 and I-70 (dated April 28, 1997) and INDOT's Mini-Scope and Cost Estimate for S.R. 37/S.R. 69 (dated September 6, 1996). For interchange types not utilized in either of these studies, these types were compared to those that were utilized, and a scaling factor was applied to determine a cost. The order of costs for the different types of interchanges, from lowest to highest was: 1) directional ramp; 2) tight diamond; 3) urban single point diamond; 4) rural diamond; 5) trumpet; 6) partial cloverleaf; 7) full cloverleaf; and 8)directional. The cost figures used from INDOT's Mini-Scope Cost Estimates only included pavement costs. Therefore, to determine the pavement and earthwork cost, the following percentages were applied for the construction of an interchange: pavement – 40%; earthwork – 35%; and bridges and right-of-way – 25%. By utilizing these percentages, an earthwork cost was calculated for each type of interchange based on the pavement costs. These two numbers were summed to obtain a total pavement and earthwork cost for each type of interchange. For each type of interchange a range of costs was given. This range will help to account for any variety of scenarios that could be encountered at the interchange locations.

The system interchange located at I-465 and SR 37 was a unique situation. Rather than using the unit value for a directional interchange, an independent estimate was performed here. Reasonable ramp configurations that could be studied in Tier 2 were identified. Square footage of the bridges was determined. The amount of ramp embankment sections and the need for earth-retained walls were also computed. Finally the amount of exit and entrance ramp work was estimated. This resulted in an interchange cost ranging from \$60 million to \$80 million. This was used rather than the table value of \$11.25 million. The interchange costs used are displayed in a table at the end of Section 2.3.

The system interchange located at I-64 and I-164 was another unique situation. Rather than using the table unit value for a directional interchange (\$9.4 to \$11.25 million), an estimate of \$20 million to \$30 million was used. Reasonable ramp configurations that could be studied in Tier 2 were identified. Square footage of the bridges was determined. The amount of ramp embankment sections and pavement was determined. Finally the amount of exit and entrance ramp work was estimated. The interchange costs used are displayed in a table at the end of Section 2.3.

2.2.2 INTERCHANGE BRIDGES

The unit cost of constructing a new bridge for an interchange was obtained from average construction costs from previous bridge design projects. Bridges associated with the Urban Single Point Diamond interchange had higher unit costs than other interchange bridges due to the complexity of that type of interchange. Segments utilizing existing roadways (e.g. U.S. 41 or S.R. 37) would use the existing bridges, with some rehabilitation (e.g. widening, deck overlaying, railing replacement, etc.). The unit cost for these bridges was estimated at 40% of the unit cost for a new bridge. The length of each bridge was evaluated on a case-by-case basis. The costs used are displayed in a table at the end of Section 2.3.

2.2.3 INTERCHANGE MAINTENANCE OF TRAFFIC

The unit cost associated with maintaining traffic during the construction of new interchanges, or reconstruction of existing interchanges, was assumed to only involve detour signage. This cost taken from an average cost for interchange maintenance of traffic from previous projects. It should be noted that a larger amount for maintenance of traffic is included with the mainline maintenance of traffic described above. The costs used are displayed in a table at the end of Section 2.3.

2.2.4 INTERCHANGE SIGNING AND LIGHTING

The unit cost of Signing and lighting for interchanges was taken from the aforementioned INDOT General Guidelines (converted to 1999 dollars). For interchange types not listed in these guidelines, these types were compared to the size of the interchanges listed, and a scaling factor was used to determine the cost. The order of costs for the different types of interchanges, from lowest to highest was assumed as: 1) directional ramp; 2) tight diamond; 3) urban single point diamond; 4) rural diamond; 5) trumpet; 6) partial cloverleaf; 7) full cloverleaf; and 8) directional. The costs used are displayed in a table at the end of Section 2.3.

2.3 BRIDGE COSTS

2.3.1 CREEK/RIVER CROSSINGS

The unit costs for new bridge construction over a creek or river were obtained by calculating an average construction cost from previous bridge design projects. Segments utilizing existing roadways (e.g. U.S. 41 or S.R. 37) would use the existing bridges, with some rehabilitation (e.g. widening, deck overlaying, railing replacement, etc.), the unit cost for such a use of existing bridges is approximately 40% of the unit cost for a new bridge. The length of a bridge for segments along new alignment was obtained by finding a state or U.S. highway nearby that crosses the same creek or river, and then increasing that bridge's length (as found in the Inventory of Bridges State Highway System of Indiana) by 30% for creeks and 20-25% for major rivers. If no state or U.S. highway crossed a particular creek, the length of the bridge was assumed to be 100 ft. Bridge widths were assumed as: 1) 43 feet for a four-lane rural section; 2) 49 feet for a four-lane urban section; 3) 55 feet for a six-lane rural section; 4) 61 feet for a six-lane urban section; 5) 73 feet for an eight-lane urban section; 6) 85 feet for a ten-lane urban section; and 7) 97 feet for a twelve-lane urban section. The costs used are displayed in a table at the end of Section 2.3.

2.3.2 GRADE SEPARATIONS (COUNTY ROAD OVER INTERSTATE)

The unit cost of constructing a new county road bridge over the mainline was obtained from average construction costs from previous bridge design projects. For segments utilizing existing roadways (e.g. U.S. 41 or S.R. 37) all existing overhead bridges were assumed to need no work unless the existing mainline roadway was to be widened. In that case, the overhead bridge would be lengthened to account for the wider roadway it bridged. The length of new bridges was assumed to be 250 ft (slightly longer bridge lengths were used when associated with more lanes on the mainline roadway). The width of these bridges was assumed to be 45 ft. The bridge width was increased if the width of the crossing road was known (or assumed) to be larger than 45 ft. The costs used are displayed in a table at the end of Section 2.3.

2.3.3 GRADE SEPARATIONS (INTERSTATE OVER COUNTY ROAD)

The unit cost of constructing a new mainline bridge over a county road was obtained from average construction costs from previous bridge design projects. For segments utilizing existing roadways (e.g. U.S. 41 or S.R. 37), all existing bridges were assumed to be adequate, with some rehabilitation (e.g. widening, deck overlaying, railing replacement, etc.) needed. The unit cost was estimated to be 40% of the unit cost for a new bridge. The length of a bridge for segments along new alignment was assumed to be 165 ft, while the width was assumed to be: 1) 43 feet for a four-lane rural section; 2) 49 feet for a four-lane urban section; 3) 55 feet for a six-lane rural section; 4) 61 feet for a six-lane urban section; 5) 73 feet for an eight-lane urban section; 6) 85 feet for a ten-lane urban section; and 7) 97 feet for a twelve-lane urban section. The costs used are displayed in a table at the end of Section 2.3.

TABLE HH-1
TABLE OF STANDARDIZED COSTS

ITEM	UNIT COST	SOURCE:
MAINLINE PAVEMENT COSTS:		
	$ / mile	
-Rural four (4) lane divided high speed arterial (excludes bridges & interchanges):	2,000,000	Calculations/Trns-port Estimator
-Urban four (4) lane divided high speed arterial with concrete median barrier (excluding bridges & interchanges):	2,500,000	Calculations/Trns-port Estimator
-Rural six (6) lane divided high speed arterial (excludes bridges & interchanges):	2,850,000	Calculations/Trns-port Estimator
-Urban six (6) lane divided high speed arterial with concrete median barrier (excludes bridges & interchanges):	3,250,000	Calculations/Trns-port Estimator
-Urban eight (8) lane divided high speed arterial with concrete median barrier (excludes bridges & interchanges):	3,750,000	Calculations/Trns-port Estimator
EARTHWORK COSTS:		
	$ / mile	
Flat Terrain	1,300,000	Calculations/Prev. Studies
Rolling Terrain / Common Excavation	2,450,000	Calculations/Prev. Studies
Rolling Terrain / Rock Excavation	4,100,000	Calculations/Prev. Studies
Hilly Terrain	11,300,000	Calculations/Prev. Studies
ADDITIONAL EARTHWORK FOR ELEVATED INTERSTATE COSTS:		
	$ / mile	
Elevate Roadway 15 ft Above Grade (4 Lanes)	3,925,000	Calculations/Trns-port Estimator
Elevate Roadway 15 ft Above Grade (6 Lanes)	4,900,000	Calculations/Trns-port Estimator
Elevate Roadway 15 ft Above Grade (8 Lanes)	5,800,000	Calculations/Trns-port Estimator
MAINTENANCE OF TRAFFIC COSTS:		
	$ / mile	
-Two way traffic (incl. Shldr rehab, concrete median barrier, temp. crossover, type "B", both directions)	430,000	Combination: General Guidelines/Calculations/Prev. Studies

ITEM	UNIT COST		SOURCE:
SIGNING AND LIGHTING COSTS:			
	$ / mile		
-Signing and Lighting (not including Interchanges)	150,000		Calculations/Prev. Studies
-Signing and Lighting (for adding a travel lane to existing Interstate)	125,000		Calculations/Prev. Studies
ADDITIONAL (MISCELLANEOUS) ROAD COSTS:			
	$ / mile		
-Rural two (2) lane frontage road (excludes bridges & interchanges) and Rural two (2) road at grade separations:	825,000		Calculations/Previous Studies
	$ / (ft^2)		
-Mechanically stabilized earth (MSE) retaining walls	30		General Guidelines
	$ / (ft^2)		
-Leveling Pads, Concrete	20		Calculations/Trns-port Estimator
MAINLINE REMOVAL COSTS:			
	$ / yd^2		
-Pavement removal (concrete)	6		Calculations/Trns-port Estimator
-Bridge Removal	**$**		
1. Steel beam, slab, box beam (< 15 m span, 49 ft span)	15,300		General Guidelines
2. Steel beam, slab, box beam (15-30 m span, 49-98 ft span)	25,400		General Guidelines
3. Steel beam, slab, box beam (30-45 m span, 98-148 ft span)	35,600		General Guidelines
INTERCHANGE COSTS (Pavement and Earthwork):			
	LOW	**HIGH**	
-Simple / traditional diamond	4,700,000	7,500,000	Previous Studies
-Tight diamond	3,750,000	5,650,000	Previous Studies
-Urban single point diamond	4,700,000	6,575,000	Previous Studies
-Partial cloverleaf	7,050,000	8,925,000	Previous Studies
-Full cloverleaf	7,975,000	9,850,000	Previous Studies
-Directional	9,400,000	11,250,000	Previous Studies
-Trumpet	4,700,000	7,500,000	Previous Studies
-Directional Ramp	1,175,000	1,875,000	Previous Studies
-Folded diamond	4,700,000	7,500,000	Previous Studies
-System Interchange at I-465 and SR 37	$60 - $80 million		Hand Calculated
-System Interchange at I-64 and I-164	$20 - $30 million		Hand Calculated
INTERCHANGE COSTS (BRIDGES)			

ITEM	UNIT COST	SOURCE:
	$ / (ft^2) of deck area	
Grade Separation	85	Calculations/Previous Studies
Single Point Urban Grade Separation	120	Calculations/Previous Studies
INTERCHANGE MAINTENANCE OF TRAFFIC COSTS:		
	$ / interchange	
-Rural Diamond	20,000	Calculations/Prev. Studies
-Tight Diamond	20,000	Calculations/Prev. Studies
-Partial Cloverleaf	30,000	Calculations/Prev. Studies
-Directional Interchange	40,000	Calculations/Prev. Studies
-Urban Single Point Diamond	100,000	Calculations/Prev. Studies
-Full Cloverleaf	30,000	Calculations/Prev. Studies
-Trumpet Interchange	40,000	Calculations/Prev. Studies
-Directional Ramp	10,000	Calculations/Prev. Studies
INTERCHANGE SIGNING AND LIGHTING COSTS:		
-Interchange signing:	$	
1. Diamond interchange	254,000	General Guidelines
2. Partial Cloverleaf	407,000	Scaling Factor * General Guidelines
3. Full Cloverleaf	407,000	General Guidelines
4. Directional Interchange	410,000	Scaling Factor * General Guidelines
5. Trumpet Interchange	275,000	Scaling Factor * General Guidelines
-Interchange lighting:	$	
1. Diamond interchange	153,000	General Guidelines
2. Partial cloverleaf	305,000	General Guidelines
3. Full Cloverleaf	508,000	General Guidelines
4. Directional Interchange	510,000	Scaling Factor * General Guidelines
5. Trumpet Interchange	175,000	Scaling Factor * General Guidelines
BRIDGE COSTS:		
-New construction	$ / (ft^2) of Deck Area	
1. Creek / River Crossing (slab, steel beam, concrete girder)	85	Previous Studies
2. Grade Separations (steel beam, concrete girder, etc.)	85	Previous Studies

2.4 REST AREAS

The costs to construct rest areas were combined as one unit cost per rest area. Costs were obtained from recently constructed rest areas. This cost of $6.2 million was rounded up to $7 million for purposes of this estimate. Each alternative is assumed to have two rest area locations with rest areas for both northbound and southbound traffic (4 total). It was estimated that each rest area would utilize approximately 40 acres of right-of-way (160 acres total). Based on a right-of-way cost of approximately $160,000 per rest area, the unit price for rest areas including right-of-way is $7.16 million.

2.4 RIGHT OF WAY COSTS

In determining the cost of right-of-way, two different scenarios were used. The first involved right-of-way and relocation for new terrain roads where there was minimal development. A cost of approximately $450,000 per mile was assigned to this case. This cost was derived from the 1995 right-of-way and relocation costs from the DEIS for Option 1 for the Southwest Indiana Highway. A 5% annual inflation rate for six years was computed and then a 15% contingency was added. This cost estimate was in 2001 dollars and assumes no major additional commercial or industrial development has occurred. This approach was used to prepare cost for the Route Concept Screening conducted early in the study.

The second scenario involved field review of all the alternatives with a more in depth field reviews in more heavily developed locations. An INDOT approved appraiser evaluated the properties that would be impacted by the various working alignments and categorized properties into a range of values. This approach was used to prepare cost for the alternatives identified in the DEIS published in 2002.

During the latter stages of the preparation of the DEIS in 2002, the alternatives were broken down into segments. Field surveys for each alignment resulted in a more detailed accounting of right-of-way cost based on the actual development noted. Right-of-Way costs for each alternative and each enclosed segment were developed. These were a summation of the various sections that made up the segment. Representing better data, this appraised cost in undeveloped and developed areas was used for the cost of right-of-way in the DEIS rather than the template values.

Impacts were assessed using working alignments depicted on aerial photos for the build alternatives. Generally, a 300-foot right-of-way width was used for assessing impacts, however, right-of-way width variations were made depending on terrain and accessibility. These variations generally follow the changes in cross-section widths as described in Appendix E.

Some properties that were close but outside of the working alignment were assumed to be taken. The actual right-of-way width will vary depending on terrain, stream crossings and placement of frontage roads. The possible upgrade of US 41 or SR 37 from four-lane divided highways to Interstate facilities would utilize much of the existing right-of-way, although there are locations where additional right-of-way would be required, namely strip right-of-way where the current section is not wide enough for current design standards and at proposed interchange locations and for access/frontage roads.

The numbers shown for relocations in the FEIS are based on the working alignment within each corridor. The homes and businesses were field checked. Neighborhoods and communities that were impacted by the roadway or through lost access were evaluated in the field. The Tier 2 NEPA documents will ultimately identify an alignment within the corridor.

Right-of-way and relocation costs include right-of-way costs for acreage and improvements required for actual construction, relocation costs, costs for acquiring structures and improvements, loss of access, and administrative fees. These costs are estimates only and are based on a field survey. An INDOT approved appraiser evaluated the properties that would be impacted by the various working alignments and categorized properties into a range of values. Utility facility relocation costs were not included in these estimates. The right-of-way for proposed interchanges has not yet been determined precisely and is only estimated at this time based on the type of interchange and approximations of right-of-way. These costs are for comparison purposes only. They could change after more precise right-of-way requirements have been determined.

2.6 ENGINEERING COSTS

2.6.1 HIGHWAY DESIGN ENGINEERING

The cost for highway design engineering was estimated as a percentage of the construction costs for the various highway components: mainline pavement; earthwork; maintenance of traffic; signing and lighting; miscellaneous road costs; mainline removal; and interchange pavement and earthwork. Different percentages were used depending on if the construction was through an urban or a rural area. For Highway design in a rural area, the design engineering is estimated at 4% of the construction cost. Due to more complexities, design engineering in an urban section was estimated at 6% of the construction cost (with a typically higher construction cost per mile for the urban section).

2.6.2 BRIDGE DESIGN ENGINEERING

The cost for bridge design engineering was estimated as a percentage of the construction costs for the various bridges: creek/river crossings; grade separations (county road over Interstate); grade separations (Interstate over county road); and interchanges. Different percentages were used for construction in urban and rural areas. This percentage was 7% of construction cost for bridges in rural areas and 8% of construction cost in urban areas.

2.6.3 RIGHT-OF-WAY ENGINEERING AND SERVICES

The cost for right-of-way engineering & services was assumed to be 10 percent of the total costs for right-of-way land acquisition, improvements, and relocation costs.

2.7 ENVIRONMENTAL MITIGATION COSTS

The cost for environmental mitigation was determined on the following basis:

1. Wetland Mitigation: The acres needed for Wetland Mitigation was determined for each alternative based on the expected impact acreage. The acreage needed for mitigation was determined by using a 3:1 ratio. The cost of this mitigation, including securing suitable parcels, designing and constructing wetlands as well as administrative costs was estimated at $20,000 per acre.
2. Forest Mitigation: The acres needed for Forest Mitigation was determined for each alternative based on the expected impact acreage. The acreage needed for mitigation was determined by using a 3:1 ratio. The cost of this mitigation, including securing suitable parcels, designing and planting of trees as well as administrative costs was estimated at $10,000 per acre.
3. Noise Impact Mitigation: The impact of noise mitigation for each alternative was determined by using the number of residential receivers potentially affected and then applying a $30,000 cost per receiver to determine the cost of the noise barriers. The $30,000 cost per receiver represents the maximum INDOT can spend per impacted receiver according to their noise policy.
4. A uniform value of $2 million was applied to each alternative to represent an approximate cost to obtain access rights to any mitigation site developed.
5. Those alternatives passing through karst topography would have a mitigation cost of up to $1 million for mitigation.
6. A uniform value of up to $5 million was applied to each alternative to represent potential cost to mitigate for historic and archaeological impacts.
7. A uniform value of up to $2 million was allocated for planning grants for local governments to use for setting up comprehensive plans to aid in planned development likely to occur at or near interchanges.
8. A contingency of $15 million was applied to all alternatives for other mitigation that might be needed as a result of the Tier 2 Studies and subsequent design.

3.0 COSTS NOT INCLUDED IN TIER 1 STUDY

Since the Tier 1 study was based on a working alignment within a 2000-foot wide corridor, there is adequate room for adjustments in alignment during Tier 2 to minimize impacts. As such there were some items that were not included in the cost estimates during this phase.

The cost of utility relocations has not been determined. It is recognized that utility relocation is a normal fact of construction work. Again, for the project of this size, utility costs could be 1-3%

of the construction cost. It is not possible at this time to determine precisely where these conflicts will occur and how much they will cost. These determinations will be accomplished as a part of the Tier 2 studies.

Construction Engineering typically runs about 2 percent of the construction costs for large projects such as these. This value will be based on the staging of contracts and the actual bids received. As the project develops and more refined estimates are determined and the actual timing of the contracts are determined, a better estimate of construction costs can be made.

4.0 COST REFINEMENT AFTER TIER 1

During the Tier 2 studies, the Preferred Alternative will be divided into six sections. The alignment within each respective section will be defined based on a controlled aerial survey. Digital Terrain Modeling (DTM) will be employed to help develop the roadway line and grade. This computer-generated model will show the alignment both in horizontal as well as vertical dimensions.

The location of the alignment will be adjusted or refined when sensitive environmental features are encountered to minimize impacts. Preliminary access will be developed and additional shifts to the alignment may be necessary. Bridges will be located and sized when the alternative alignment crosses streams and other highway/railroad features. Estimates of earthwork will be able to be developed based on the Digital Terrain Model. An estimate of utility relocation costs will also be determined based on the working alignment.

All this work will result in a greater level of precision concerning the estimated quantities needed to construct the road. Based on the more detailed alignment, and more precise quantities it will be possible to develop cost estimates that will be representative of the final design costs. Construction costs will be developed at that time based on the latest unit prices. Utility coordination costs and construction engineering costs will also be included during this Tier 2 study.

During the design stages of this project, the costs will continue to be refined. These refinements will result from a more detailed analysis. The design of the roadway and bridges will begin to go through design review processes and the detailed portions of the design will be considered. With these details, the final quantities can be determined, and a final cost estimate can be determined, using the latest unit costs, for the time of construction.

SUMMARY COST TABLES BY ALTERNATIVE

AND

ALTERNATIVE MAPS

SUMMARY OF COSTS PER ALTERNATIVE

Table HH-2

Cost (Construction, Engineering, Right-of-Way) and Mileage Estimates of Alternatives					
	Cost			Driving Miles	
Alternative	Low	High	Average	Low	High
1	$ 810,000,000	$ 1,040,000,000	$ 925,000,000	154	156
2A	$ 1,090,000,000	$ 1,290,000,000	$ 1,190,000,000	147	148
2B	$ 1,170,000,000	$ 1,370,000,000	$ 1,270,000,000	145	146
2C	$ 1,550,000,000	$ 1,780,000,000	$ 1,665,000,000	146	147
3A	$ 1,290,000,000	$ 1,360,000,000	$ 1,325,000,000	142	142
3B	$ 1,730,000,000	$ 1,830,000,000	$ 1,780,000,000	141	141
3C	$ 1,730,000,000	$ 1,830,000,000	$ 1,780,000,000	142	142
4A	$ 970,000,000	$ 1,030,000,000	$ 1,000,000,000	143	143
4B	$ 1,050,000,000	$ 1,110,000,000	$ 1,080,000,000	142	142
4C	$ 1,430,000,000	$ 1,530,000,000	$ 1,480,000,000	142	142
5A	$ 1,620,000,000	$ 1,800,000,000	$ 1,710,000,000	149	152
5B	$ 1,810,000,000	$ 1,930,000,000	$ 1,870,000,000	147	147

Note: The Low and High Costs above have been rounded to the nearest $10 million and do not include mitigation and rest area costs. The average cost has been rounded to the nearest $5 million.

Mitigation Costs **Table HH-3**

MITIGATION COSTS	
Alternative	Cost
1	$ 39,640,000
2A	$ 60,070,000
2B	$ 63,790,000
2C	$ 69,350,000
3A	$ 80,450,000
3B	$ 80,310,000
3C	$ 77,130,000
4A	$ 55,900,000
4B	$ 59,670,000
4C	$ 65,390,000
5A	$ 80,990,000
5B	$ 79,920,000

Rest Area Costs: Each alternative will have 4 rest areas (2 northbound, and 2 southbound). The estimated cost of these 4 rest areas is $ 28,640,000. This cost is not included in Table HH-2.

Evansville-to-Indiananpolis Study

Tier 1 Environmental Impact Statement

Alternative 1

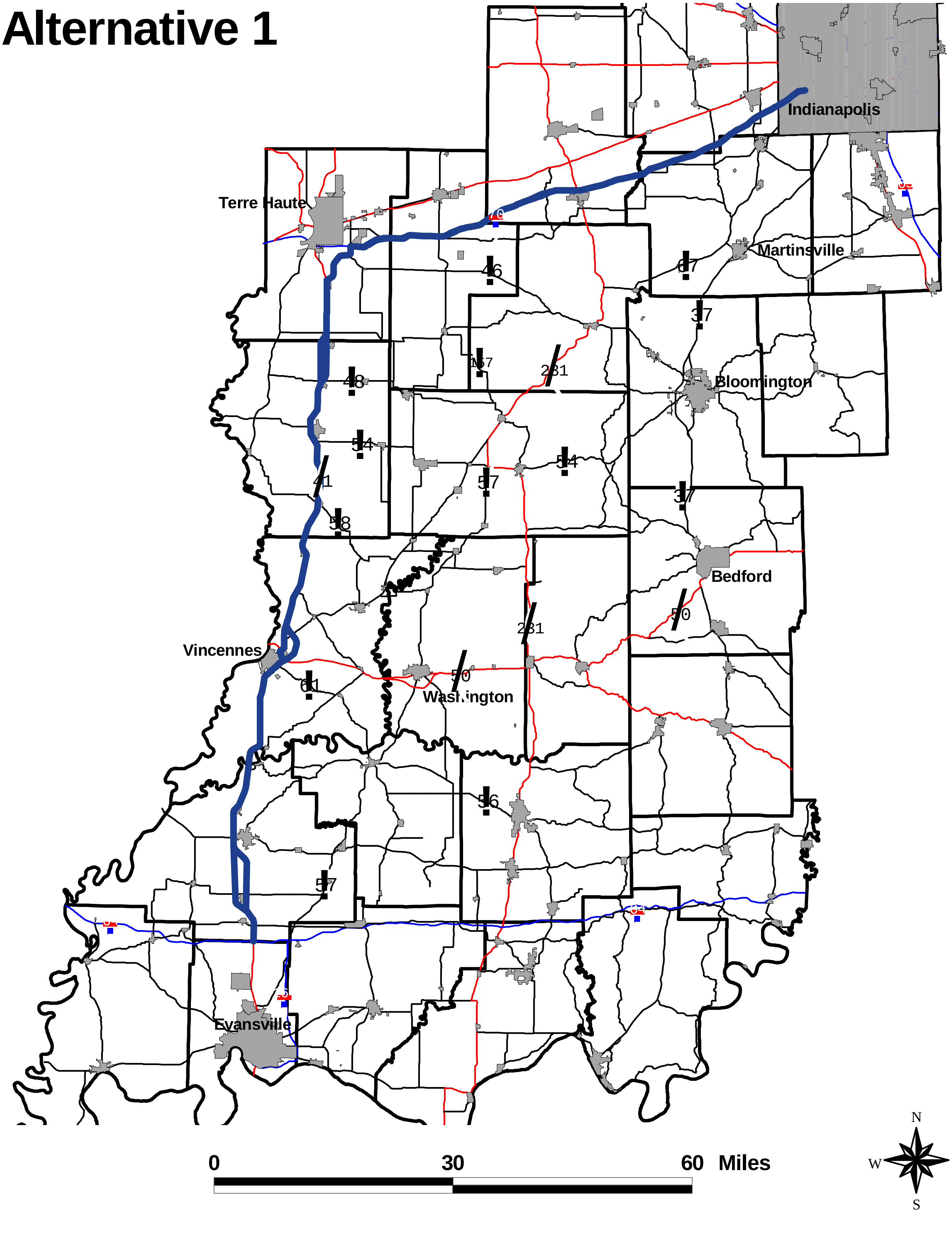


TABLE HH-4

ALTERNATIVE 1				
Construction Length:		86.65 mi -		89.02 mi
Driving Length:		153.92 mi -		156.29 mi
Construction Roadway Cost:	$	520,446,128 -	$	689,289,099
Construction Bridge Cost:	$	114,638,651 -	$	117,639,456
Subtotal Construction Cost:	$	635,084,779 -	$	806,928,555
Design Engineering Cost:	$	31,193,683 -	$	43,808,270
Right-of-Way Engineering and Services Cost:	$	12,890,000 -	$	17,280,000
Subtotal Engineering Cost:	$	44,083,683 -	$	61,088,270
Right-of-Way Cost:	$	128,900,000 -	$	172,800,000
Total (Construction / Right-of-Way / Engineering) Cost:	$	808,068,462 -	$	1,040,816,825

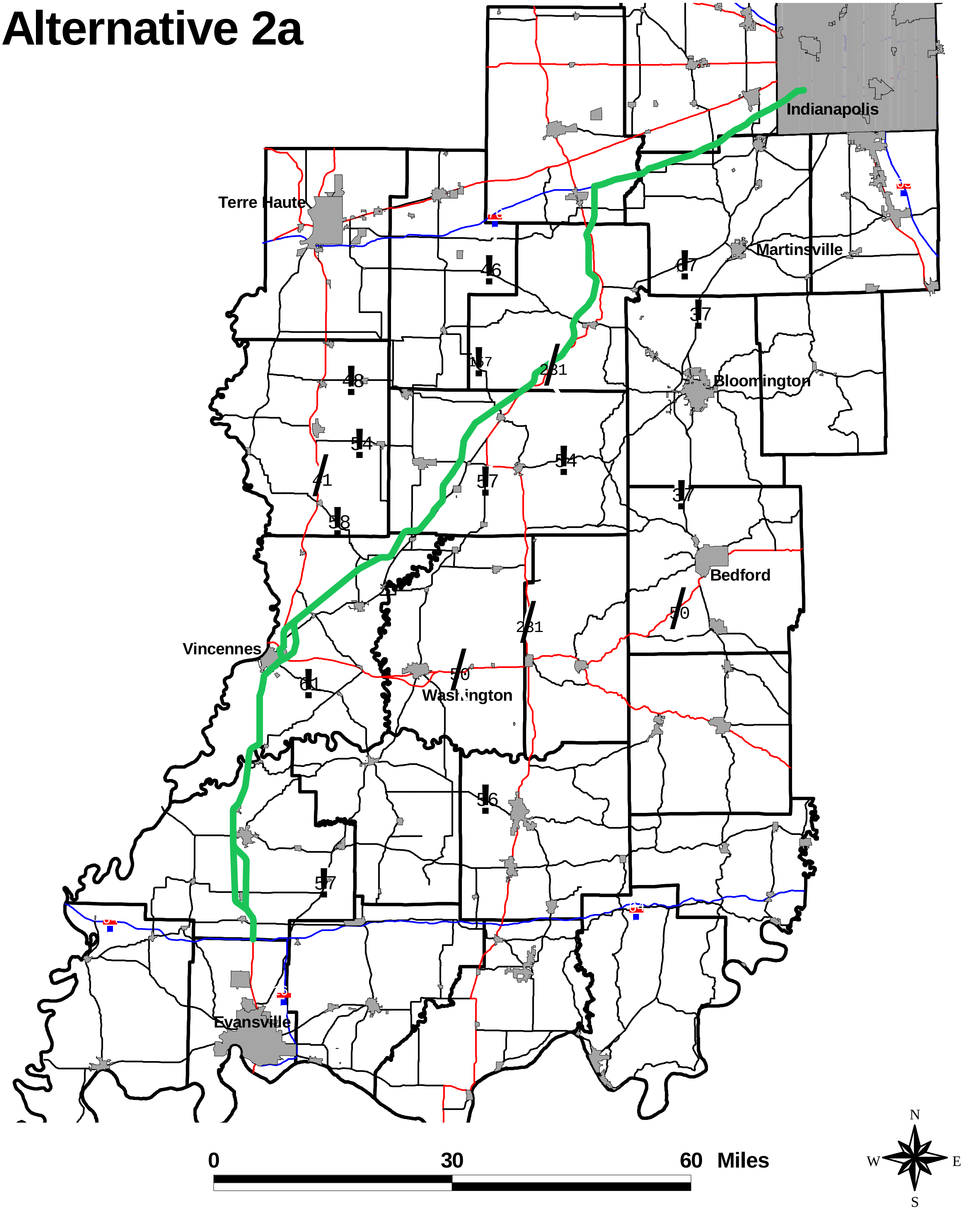
<u>Additional Costs:</u>

Mitigation Cost:	$	39,640,000
Rest Area Cost:	$	28,640,000

Evansville-to-Indiananpolis Study

Tier 1 Environmental Impact Statement

Alternative 2a



Evansville-to-Indiananpolis Study

Tier 1 Environmental Impact Statement

Alternative 2b

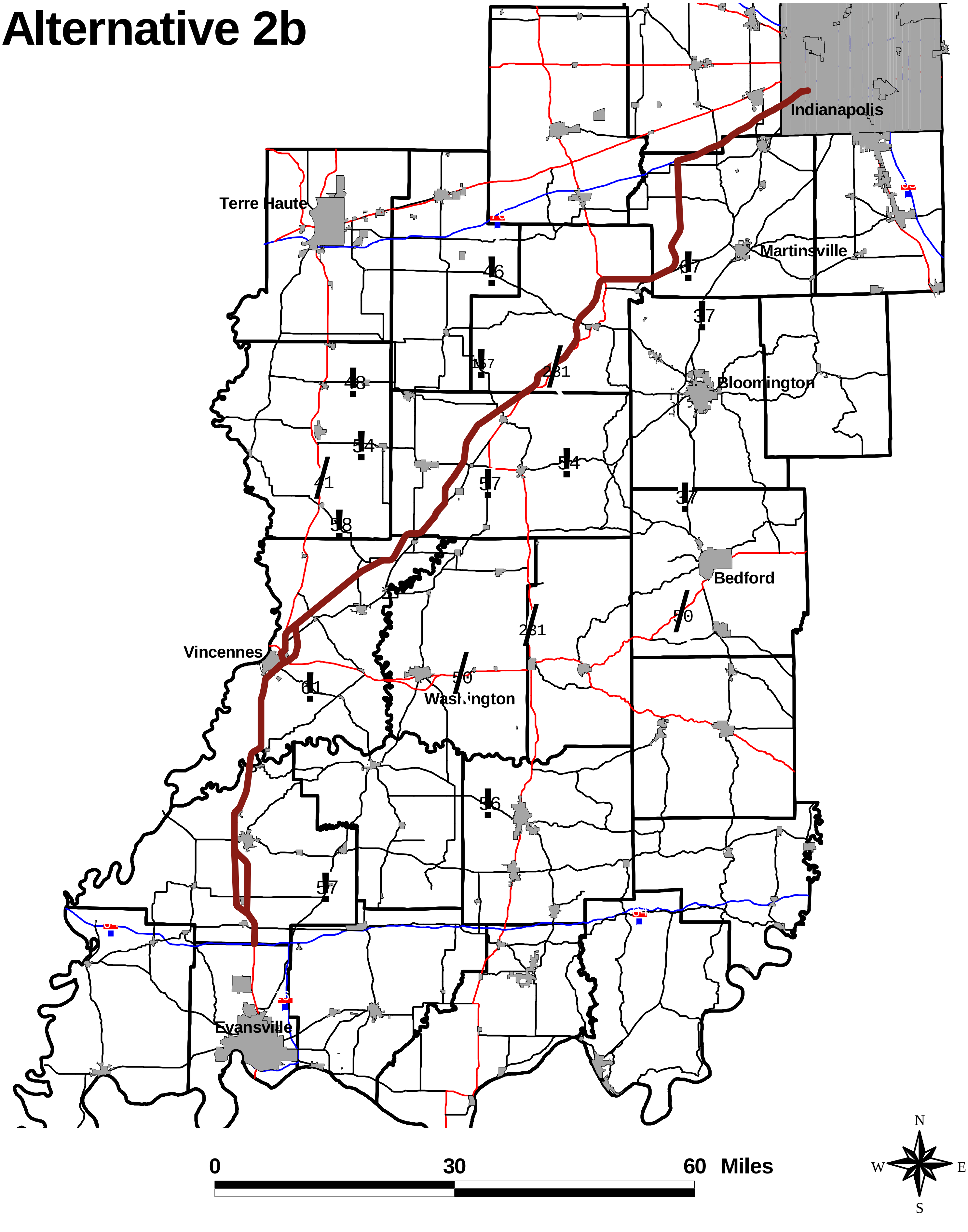


TABLE HH-5

ALTERNATIVE 2A			
Construction Length:		121.8 mi -	122.92 mi
Driving Length:		146.87 mi -	147.99 mi
Construction Roadway Cost:	$	765,065,200 - $	915,400,329
Construction Bridge Cost:	$	156,198,875 - $	164,133,290
Subtotal Construction Cost:	$	921,264,075 - $	1,079,533,619
Design Engineering Cost:	$	44,236,799 - $	54,873,750
Right-of-Way Engineering and Services Cost:	$	11,180,000 - $	13,950,000
Subtotal Engineering Cost:	$	55,416,799 - $	68,823,750
Right-of-Way Cost:	$	111,800,000 - $	139,500,000
Total (Construction / Right-of-Way / Engineering) Cost:	$	1,088,480,873 - $	1,287,857,369

Additional Costs:

Mitigation Cost:	$	60,070,000
Rest Area Cost:	$	28,640,000

TABLE HH-6

ALTERNATIVE 2B			
Construction Length:		133.03 mi -	134.15 mi
Driving Length:		145.07 mi -	146.19 mi
Construction Roadway Cost:	$	818,307,160 - $	972,367,289
Construction Bridge Cost:	$	169,977,375 - $	177,911,790
Subtotal Construction Cost:	$	988,284,535 - $	1,150,279,079
Design Engineering Cost:	$	47,330,972 - $	58,116,924
Right-of-Way Engineering and Services Cost:	$	12,100,000 - $	14,880,000
Subtotal Engineering Cost:	$	59,430,972 - $	72,996,924
Right-of-Way Cost:	$	121,000,000 - $	148,800,000
Total (Construction / Right-of-Way / Engineering) Cost:	$	1,168,715,507 - $	1,372,076,003

Additional Costs:

Mitigation Cost:	$	63,790,000
Rest Area Cost:	$	28,640,000

Evansville-to-Indiananpolis Study

Tier 1 Environmental Impact Statement

Alternative 2c

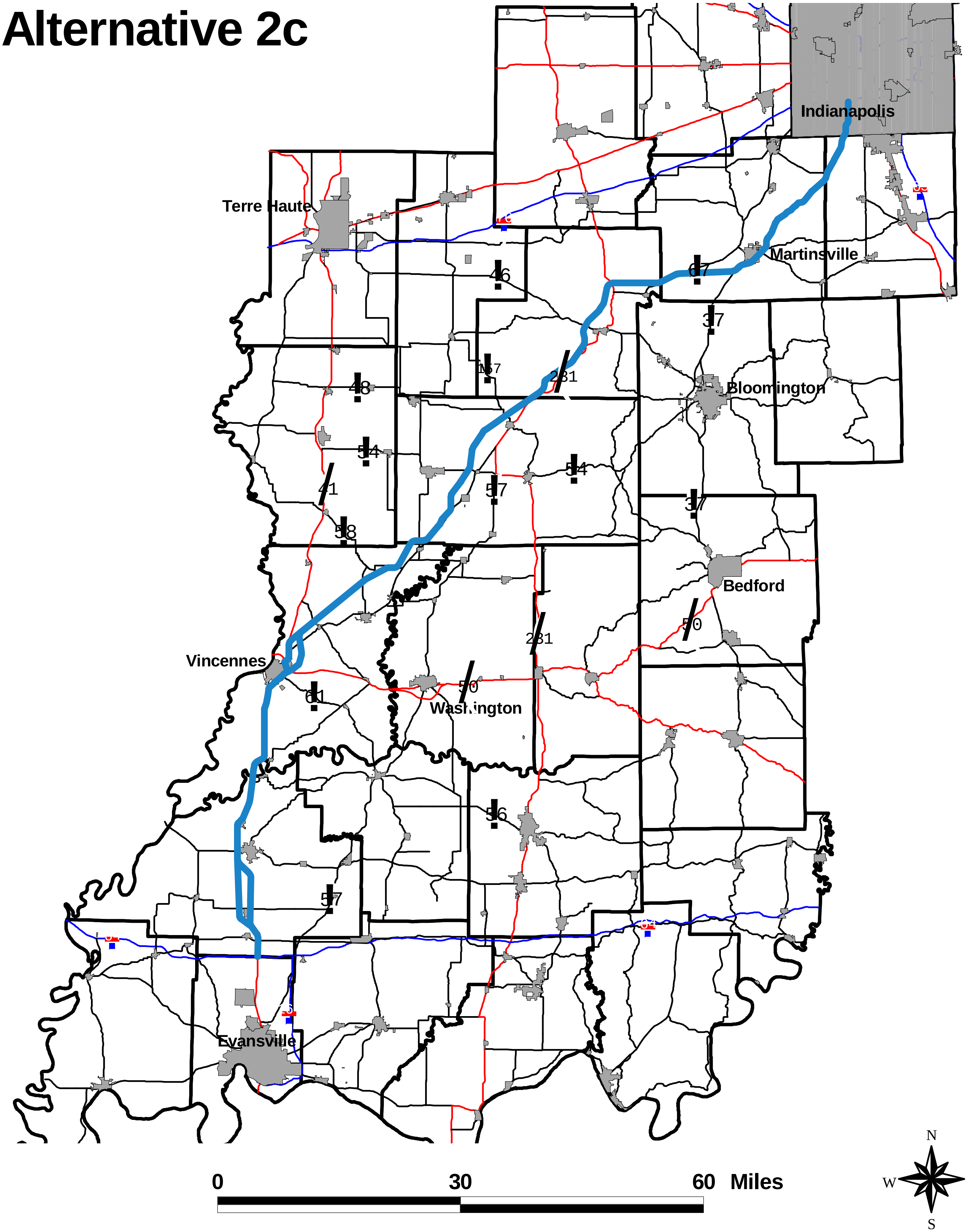


TABLE HH-7

ALTERNATIVE 2C		
Construction Length:	145.82 mi -	146.94 mi
Driving Length:	145.82 mi -	146.94 mi
Construction Roadway Cost:	$ 1,022,613,632 -	$ 1,210,723,761
Construction Bridge Cost:	$ 210,940,263 -	$ 215,511,518
Subtotal Construction Cost:	$ 1,233,553,895 -	$ 1,426,235,279
Design Engineering Cost:	$ 62,367,799 -	$ 74,927,698
Right-of-Way Engineering and Services Cost:	$ 22,810,000 -	$ 25,580,000
Subtotal Engineering Cost:	$ 85,177,799 -	$ 100,507,698
Right-of-Way Cost:	$ 228,100,000 -	$ 255,800,000
Total (Construction / Right-of-Way / Engineering) Cost:	$ 1,546,831,694 -	$ 1,782,542,977

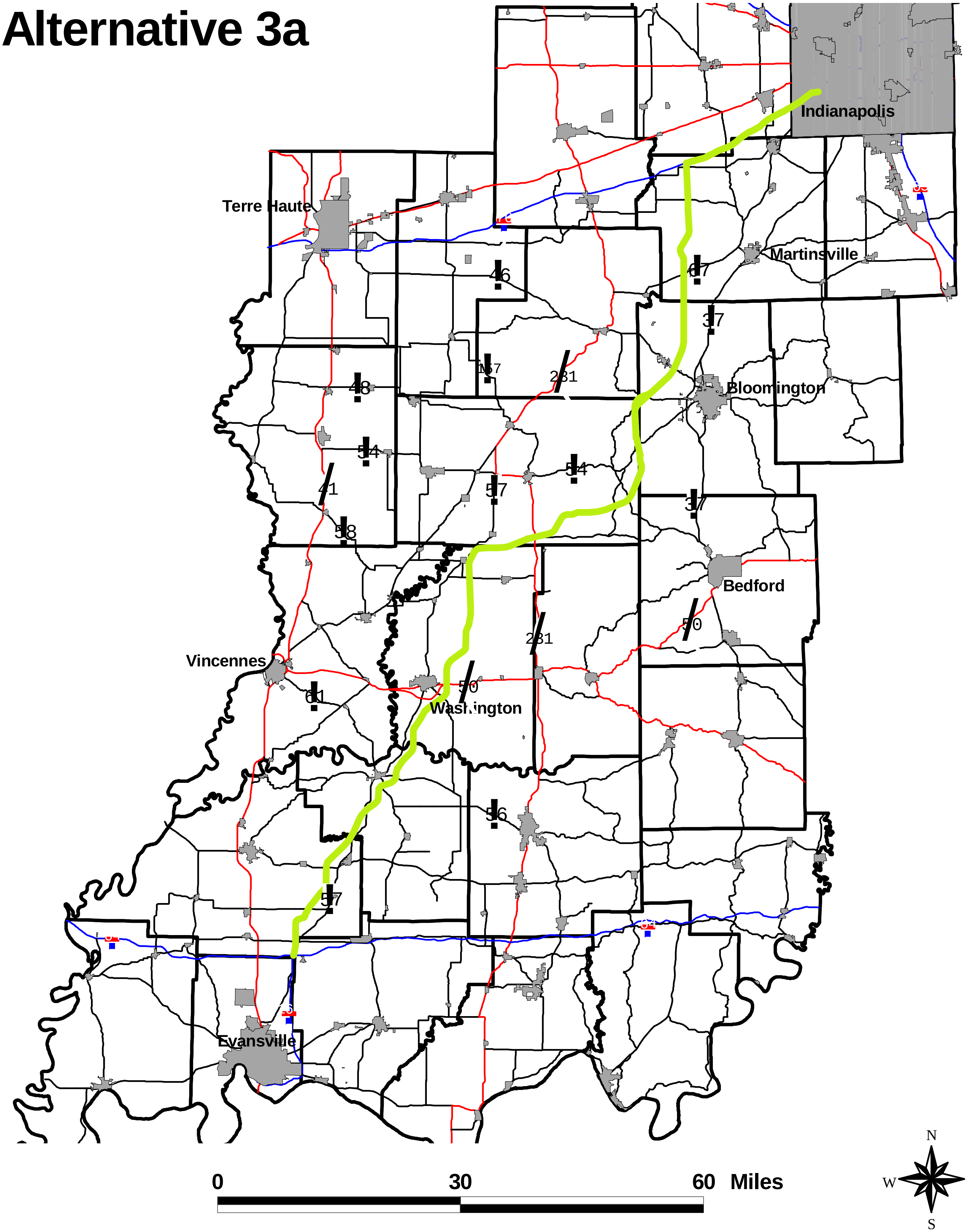
Additional Costs:

Mitigation Cost:	$	69,350,000
Rest Area Cost:	$	28,640,000

Evansville-to-Indiananpolis Study

Tier 1 Environmental Impact Statement

Alternative 3a



Evansville-to-Indiananpolis Study

Tier 1 Environmental Impact Statement

Alternative 3b

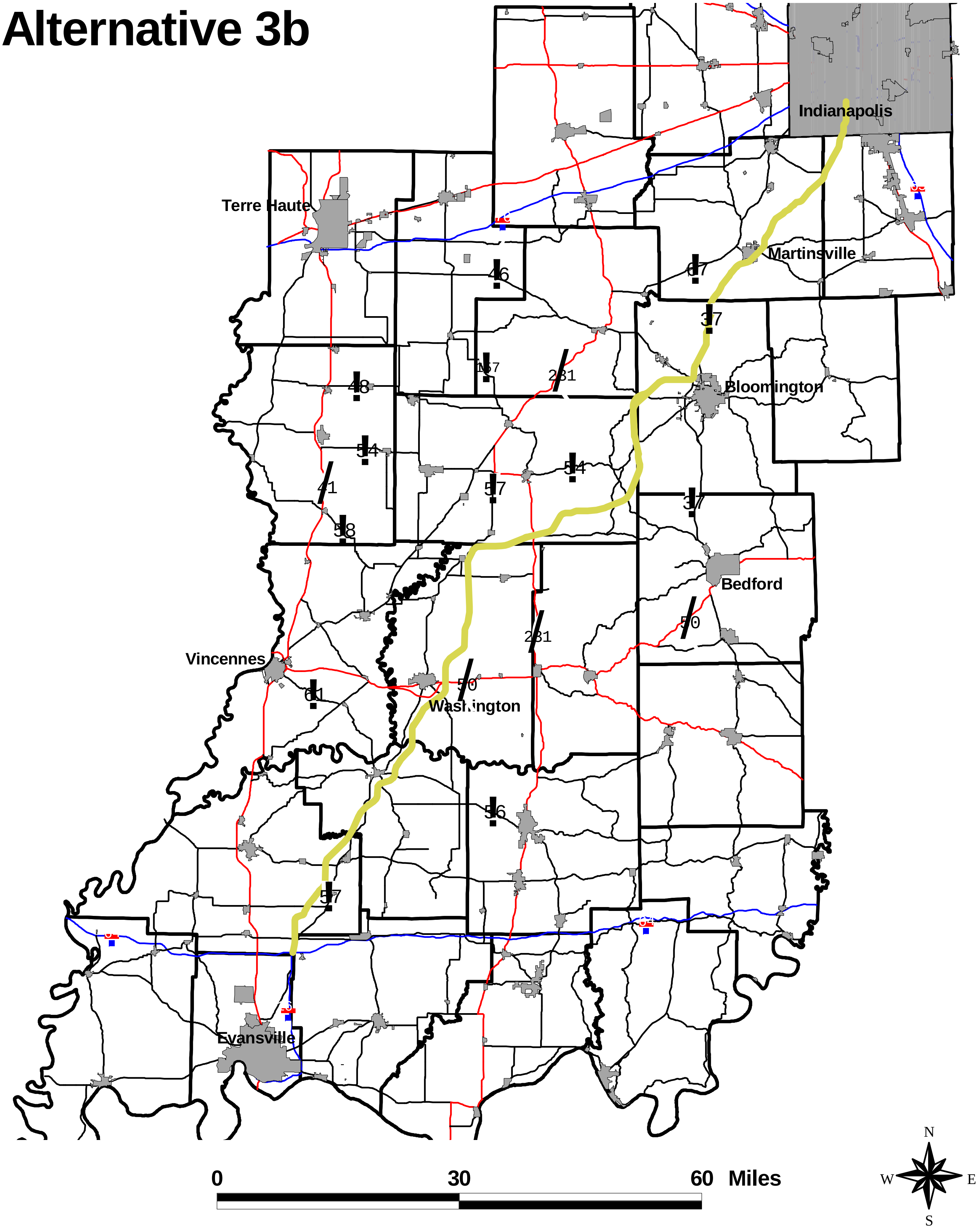


TABLE HH-8

ALTERNATIVE 3A				
Construction Length:				135.88 mi
Driving Length:				142.05 mi
Construction Roadway Cost:	$	960,388,610	- $	1,016,163,610
Construction Bridge Cost:	$	182,219,086	- $	191,603,444
Subtotal Construction Cost:*	$	1,142,607,696	- $	1,207,767,054
Design Engineering Cost:	$	52,405,114	- $	55,386,863
Right-of-Way Engineering and Services Cost:	$	9,060,000	- $	9,060,000
Subtotal Engineering Cost:	$	61,465,114	- $	64,446,863
Right-of-Way Cost:	$	90,600,000	- $	90,600,000
Total (Construction / Right-of-Way / Engineering) Cost:	$	1,294,672,809	- $	1,362,813,917

* The range in construction costs is due to a range in cost for each individual interchange within the alternative and a range in cost of rehabilitating bridges along the existing I-70.

Additional Costs:

Mitigation Cost:	$	80,450,000
Rest Area Cost:	$	28,640,000

TABLE HH-9

ALTERNATIVE 3B				
Construction Length:				140.82 mi
Driving Length:				140.82 mi
Construction Roadway Cost:	$	1,236,181,326	- $	1,333,981,326
Construction Bridge Cost:			$	197,490,781
Subtotal Construction Cost:*	$	1,433,672,107	- $	1,531,472,107
Design Engineering Cost:	$	70,011,240	- $	74,736,240
Right-of-Way Engineering and Services Cost:	$	20,710,000	- $	20,710,000
Subtotal Engineering Cost:	$	90,721,240	- $	95,446,240
Right-of-Way Cost:	$	207,100,000	- $	207,100,000
Total (Construction / Right-of-Way / Engineering) Cost:	$	1,731,493,347	- $	1,834,018,347

* The range in construction costs is due to a range in cost for each individual interchange within the alternative.

Additional Costs:

Mitigation Cost:	$	80,310,000
Rest Area Cost:	$	28,640,000

Evansville-to-Indiananpolis Study

Tier 1 Environmental Impact Statement

Alternative 3c

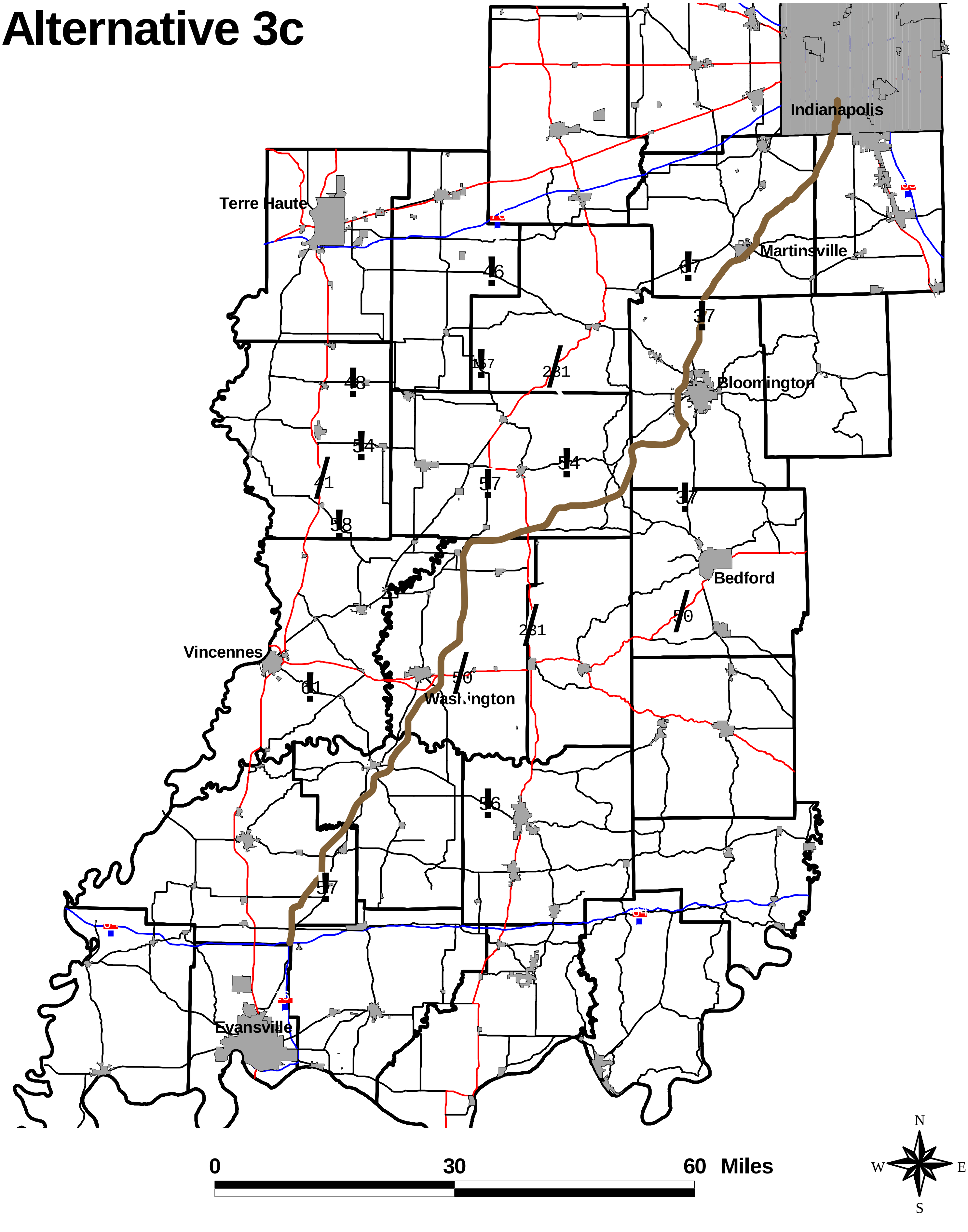


TABLE HH-10

ALTERNATIVE 3C				
Construction Length:				141.55 mi
Driving Length:				141.55 mi
Construction Roadway Cost:	$	1,188,912,982	- $	1,288,162,982
Construction Bridge Cost:			$	209,622,151
Subtotal Construction Cost:*	$	1,398,535,133	- $	1,497,785,133
Design Engineering Cost:	$	70,376,979	- $	75,347,979
Right-of-Way Engineering and Services Cost:	$	23,510,000	- $	23,510,000
Subtotal Engineering Cost:	$	93,886,979	- $	98,857,979
Right-of-Way Cost:	$	235,100,000	- $	235,100,000
Total (Construction / Right-of-Way / Engineering) Cost:	$	1,727,522,112	- $	1,831,743,112

* The range in construction costs is due to a range in cost for each individual interchange within the alternative.

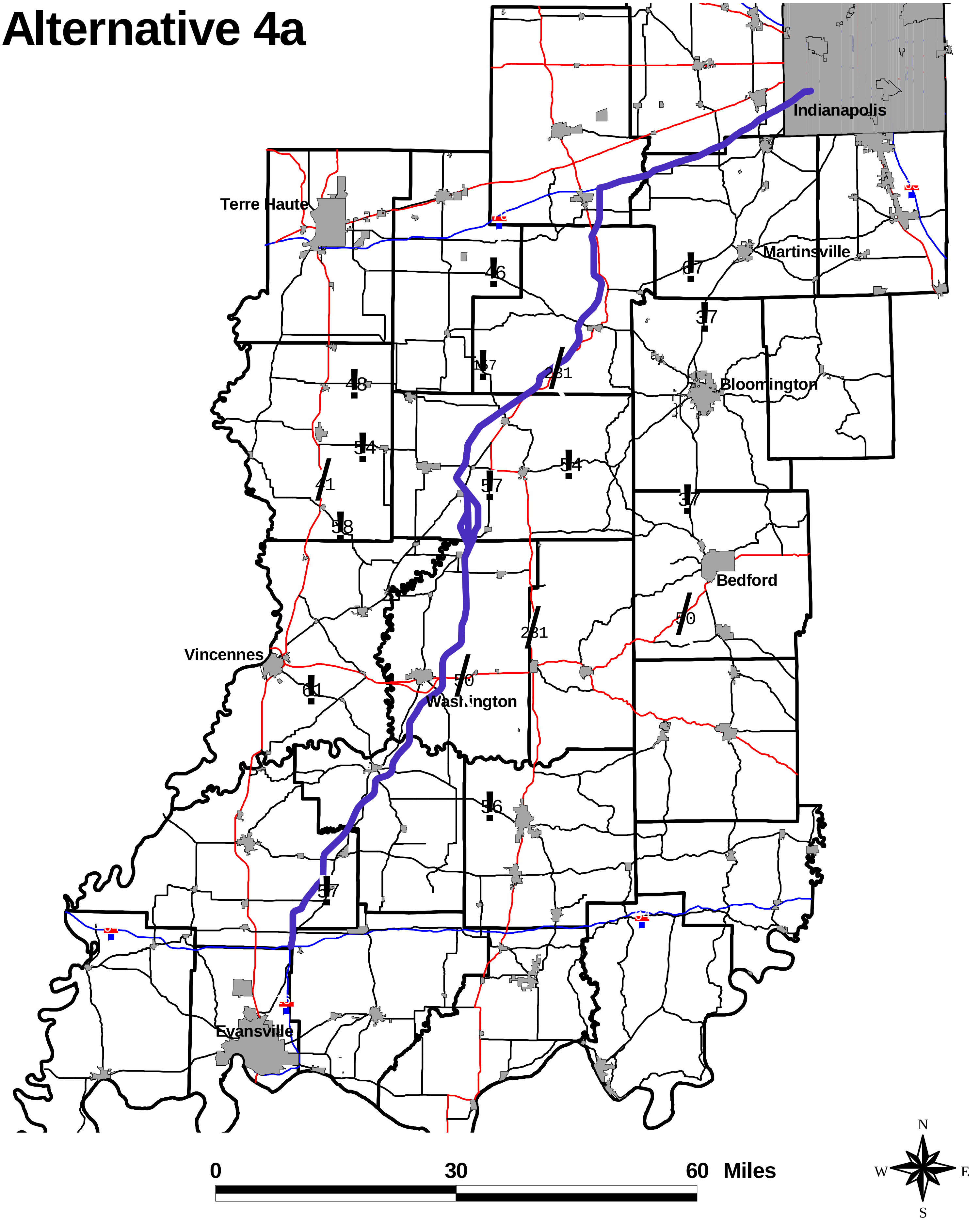
<u>Additional Costs:</u>

Mitigation Cost:	$	77,130,000
Rest Area Cost:	$	28,640,000

Evansville-to-Indiananpolis Study

Tier 1 Environmental Impact Statement

Alternative 4a



Evansville-to-Indiananpolis Study

Tier 1 Environmental Impact Statement

Alternative 4b

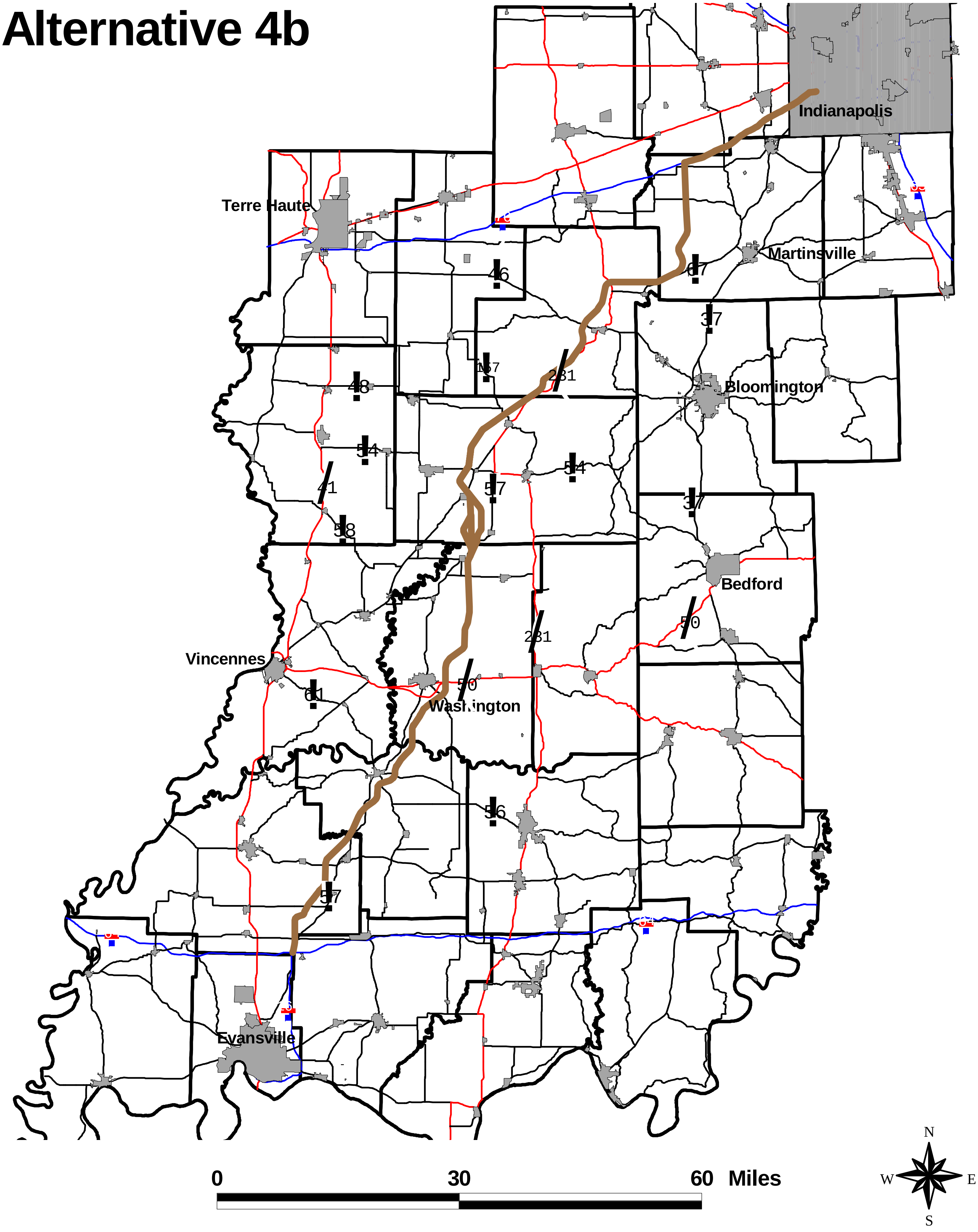


TABLE HH-11

ALTERNATIVE 4A			
Construction Length:			118.26 mi
Driving Length:			143.33 mi
Construction Roadway Cost:	$ 683,144,050	-	$ 736,094,050
Construction Bridge Cost:	$ 159,065,942	-	$ 162,429,102
Subtotal Construction Cost:*	$ 842,209,992	-	$ 898,523,152
Design Engineering Cost:	$ 39,097,174	-	$ 41,484,227
Right-of-Way Engineering and Services Cost:	$ 7,810,000	-	$ 7,810,000
Subtotal Engineering Cost:	$ 46,907,174	-	$ 49,294,227
Right-of-Way Cost:	$ 78,100,000	-	$ 78,100,000
Total (Construction / Right-of-Way / Engineering) Cost:	$ 967,217,165	-	$ 1,025,917,379

* The range in construction costs is due to a range in cost for each individual interchange within the alternative and a range in cost of rehabilitating bridges along the existing I-70.

Additional Costs:

Mitigation Cost:	$	55,900,000
Rest Area Cost:	$	28,640,000

TABLE HH-12

ALTERNATIVE 4B			
Construction Length:			129.49 mi
Driving Length:			141.53 mi
Construction Roadway Cost:	$ 736,386,010	-	$ 793,061,010
Construction Bridge Cost:	$ 172,844,442	-	$ 176,207,602
Subtotal Construction Cost:*	$ 909,230,452	-	$ 969,268,612
Design Engineering Cost:	$ 42,191,347	-	$ 44,727,400
Right-of-Way Engineering and Services Cost:	$ 8,630,000	-	$ 8,630,000
Subtotal Engineering Cost:	$ 50,821,347	-	$ 53,357,400
Right-of-Way Cost:	$ 86,300,000	-	$ 86,300,000
Total (Construction / Right-of-Way / Engineering) Cost:	$ 1,046,351,799	-	$ 1,108,926,012

* The range in construction costs is due to a range in cost for each individual interchange within the alternative and a range in cost of rehabilitating bridges along the existing I-70.

Additional Costs:

Mitigation Cost:	$	59,670,000
Rest Area Cost:	$	28,640,000

Evansville-to-Indiananpolis Study

Tier 1 Environmental Impact Statement

Alternative 4c

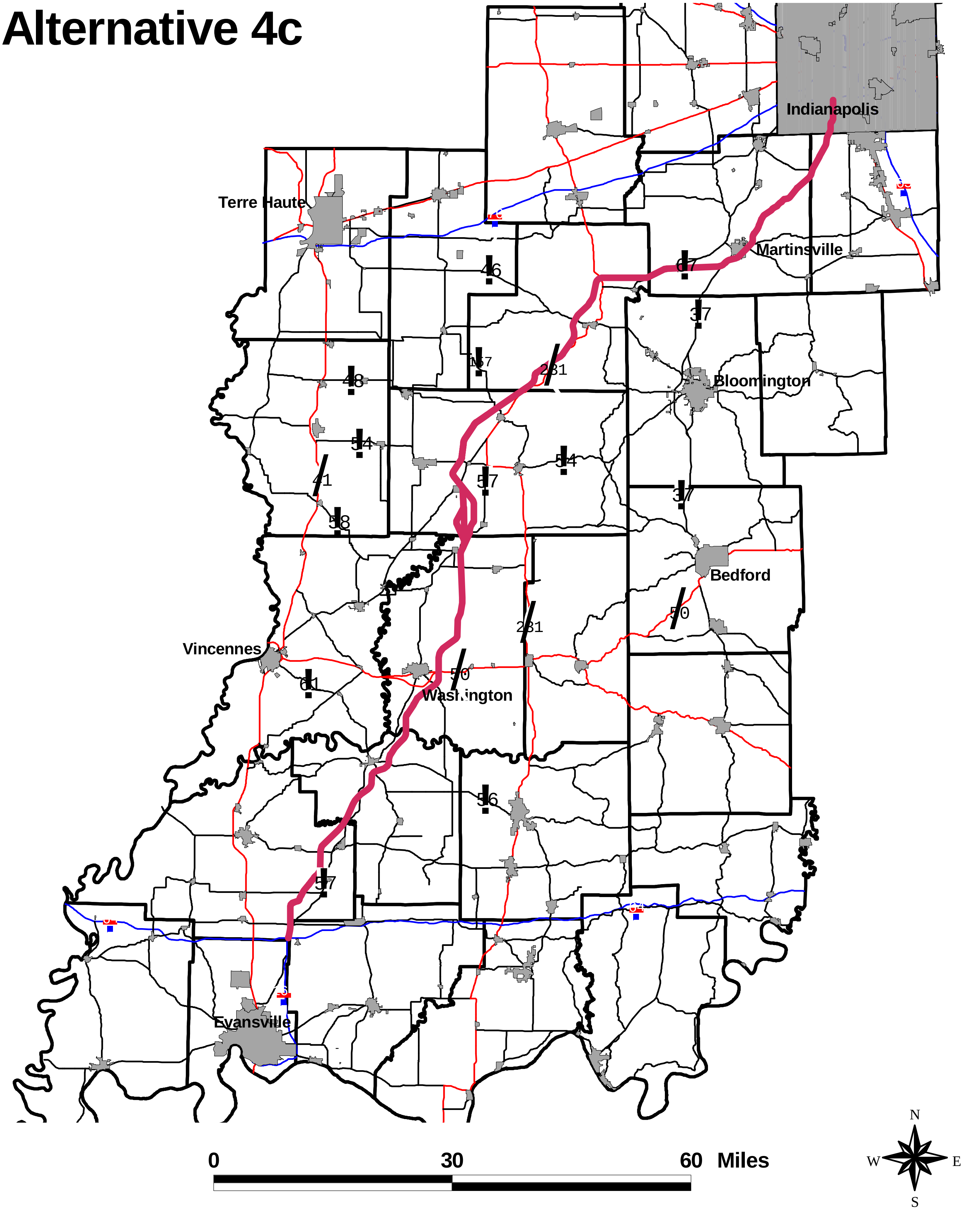


TABLE HH-13

ALTERNATIVE 4C			
Construction Length:			142.28 mi
Driving Length:			142.28 mi
Construction Roadway Cost:	$	940,692,482 - $	1,031,417,482
Construction Bridge Cost:		$	213,807,330
Subtotal Construction Cost:*	$	1,154,499,812 - $	1,245,224,812
Design Engineering Cost:	$	57,228,174 - $	61,538,174
Right-of-Way Engineering and Services Cost:	$	20,030,000 - $	20,030,000
Subtotal Engineering Cost:	$	77,258,174 - $	81,568,174
Right-of-Way Cost:	$	200,300,000 - $	200,300,000
Total (Construction / Right-of-Way / Engineering) Cost:	$	1,432,057,986 - $	1,527,092,986

* The range in construction costs is due to a range in cost for each individual interchange within the alternative.

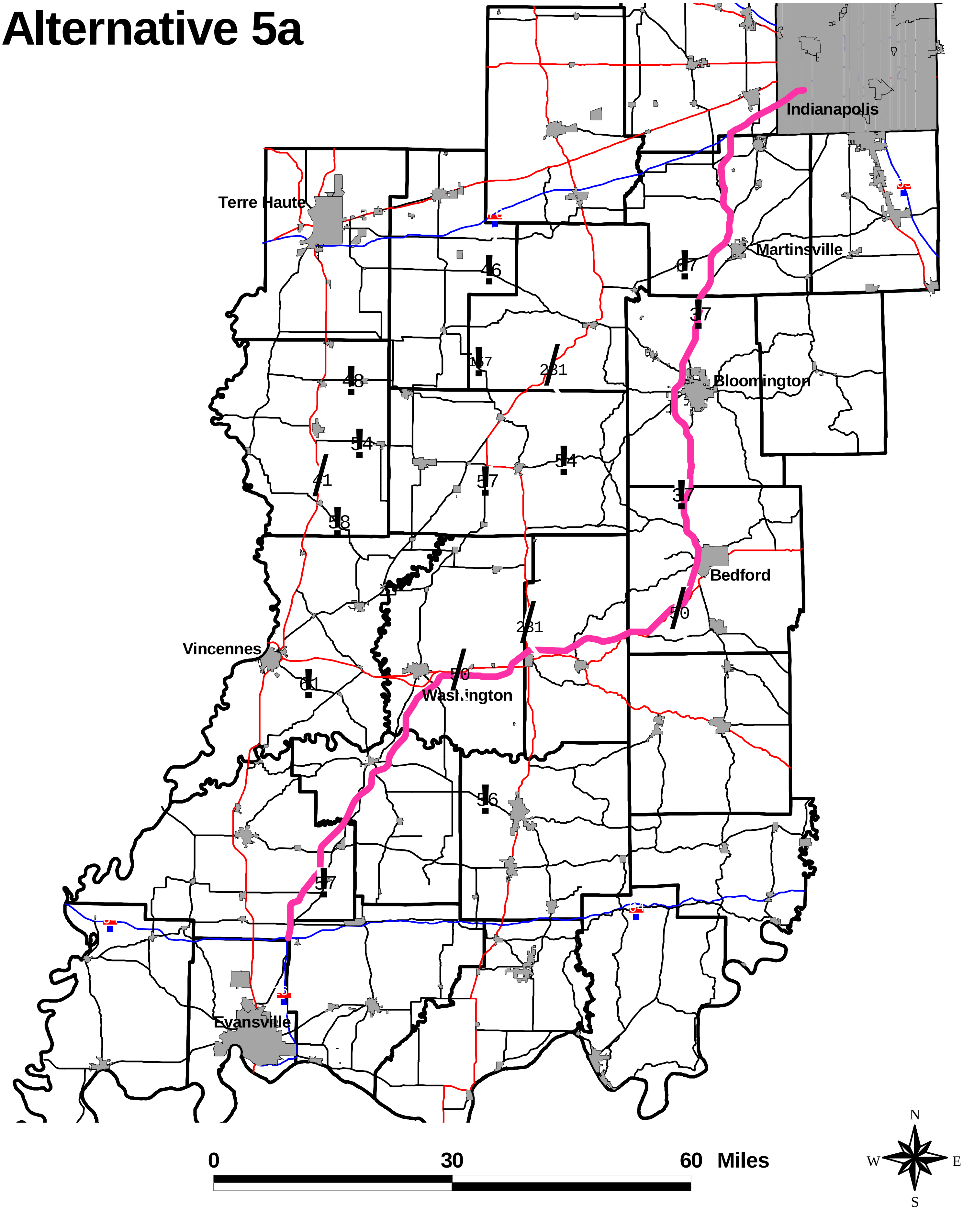
<u>Additional Costs:</u>

Mitigation Cost:	$	65,390,000
Rest Area Cost:	$	28,640,000

Evansville-to-Indiananpolis Study

Tier 1 Environmental Impact Statement

Alternative 5a



Evansville-to-Indiananpolis Study

Tier 1 Environmental Impact Statement

Alternative 5b

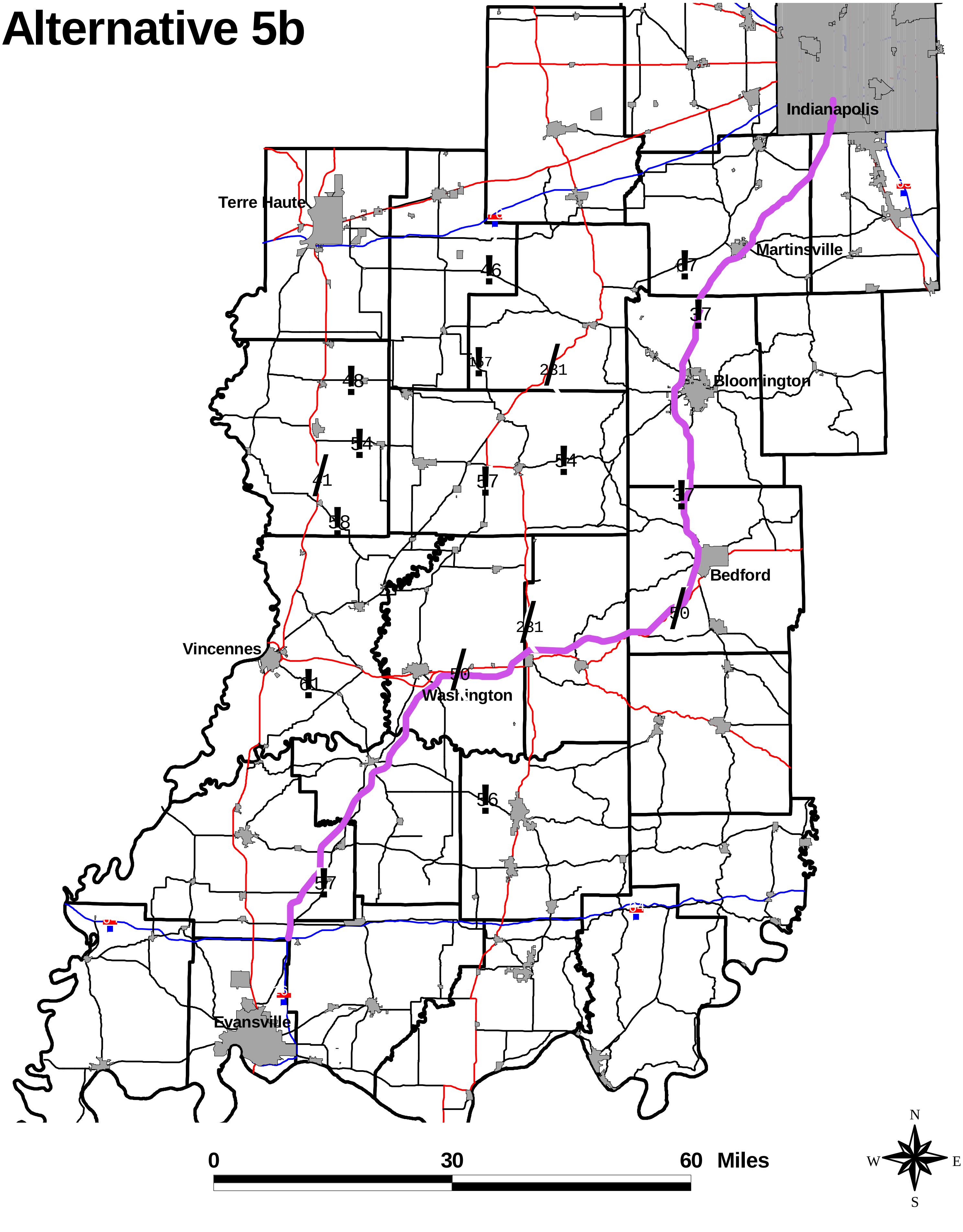


TABLE HH-14

ALTERNATIVE 5A			
Construction Length:		147.73 mi -	151.08 mi
Driving Length:		148.82 mi -	152.17 mi
Construction Roadway Cost:	$	1,118,662,505 - $	1,265,751,557
Construction Bridge Cost:	$	202,723,291 - $	221,240,517
Subtotal Construction Cost:	$	1,321,385,796 - $	1,486,992,074
Design Engineering Cost:	$	70,589,781 - $	80,228,502
Right-of-Way Engineering and Services Cost:	$	20,660,000 - $	20,660,000
Subtotal Engineering Cost:	$	91,249,781 - $	100,888,502
Right-of-Way Cost:	$	206,600,000 - $	206,600,000
Total (Construction / Right-of-Way / Engineering) Cost:	$	1,619,235,577 - $	1,794,480,576

Additional Costs:

Mitigation Cost:	$	80,990,000
Rest Area Cost:	$	28,640,000

TABLE HH-15

ALTERNATIVE 5B			
Construction Length:			146.83 mi
Driving Length:			146.83 mi
Construction Roadway Cost:	$	1,220,309,513 - $	1,332,759,513
Construction Bridge Cost:		$	200,226,540
Subtotal Construction Cost:*	$	1,420,536,053 - $	1,532,986,053
Design Engineering Cost:	$	75,183,077 - $	81,150,077
Right-of-Way Engineering and Services Cost:	$	28,370,000 - $	28,370,000
Subtotal Engineering Cost:	$	103,553,077 - $	109,520,077
Right-of-Way Cost:	$	283,700,000 - $	283,700,000
Total (Construction / Right-of-Way / Engineering) Cost:	$	1,807,789,130 - $	1,926,206,130

* The range in construction costs is due to a range in cost for each individual interchange within the alternative.

Additional Costs:

Mitigation Cost:	$	79,920,000
Rest Area Cost:	$	28,640,000

Evansville-to-Indiananpolis Study

Tier 1 Environmental Impact Statement

Alternative Hybrid 2-3c and Hybrid 4-5a

4 -5a Hybrid

2 - 3c Hybrid

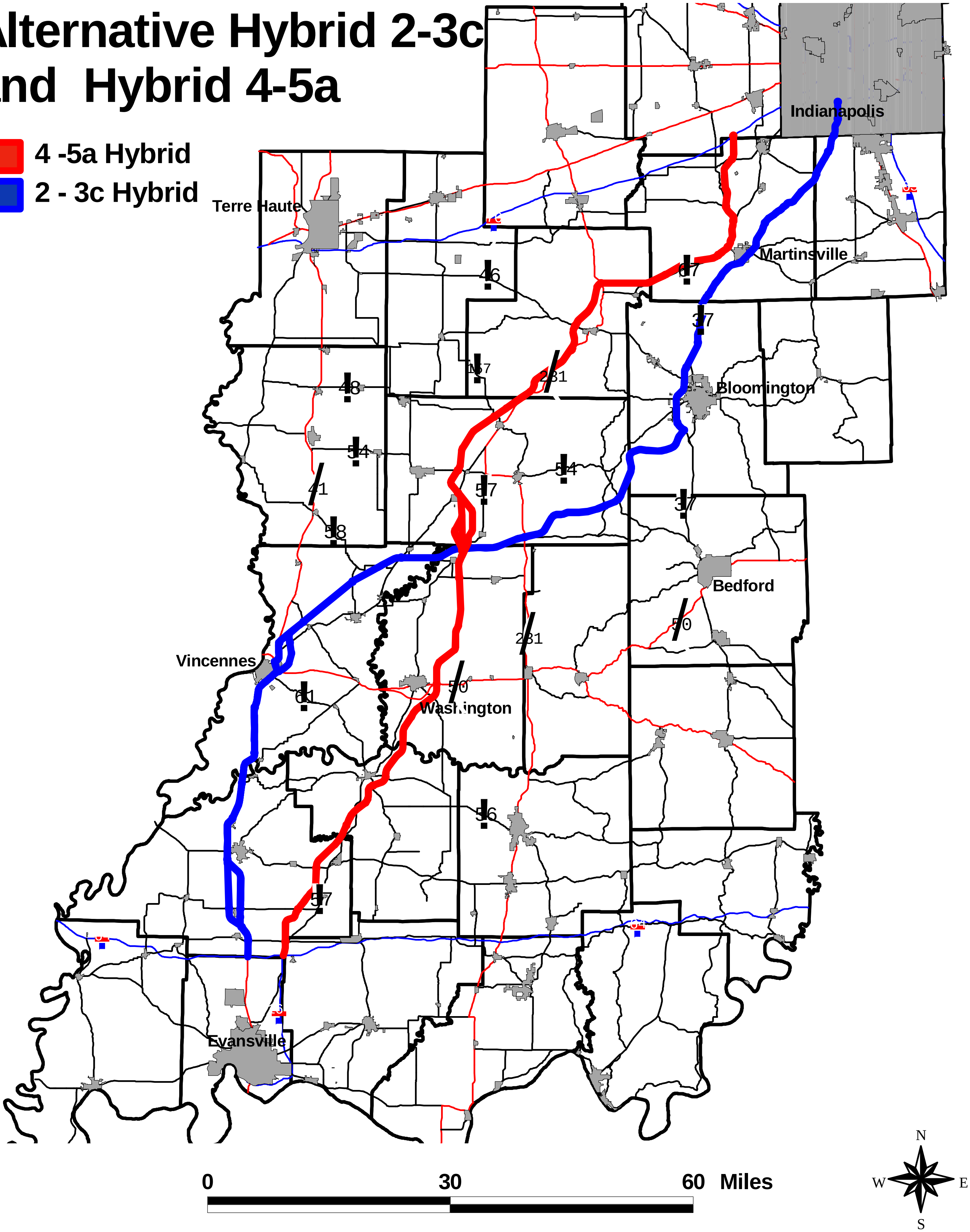


Table HH-16

HYBRID 2/3C				
Construction Length:		150.35 mi -		151.47 mi
Driving Length:		150.35 mi -		151.47 mi
Construction Roadway Cost:	$	1,315,522,882 -	$	1,518,708,011
Construction Bridge Cost:	$	222,168,134 -	$	226,739,389
Subtotal Construction Cost:	$	1,537,691,016 -	$	1,745,447,400
Design Engineering Cost:	$	78,383,068 -	$	91,865,966
Right-of-Way Engineering and Services Cost:	$	25,970,000 -	$	29,880,000
Subtotal Engineering Cost:	$	104,353,068 -	$	121,745,966
Right-of-Way Cost:	$	259,700,000 -	$	298,800,000
Total (Construction / Right-of-Way / Engineering) Cost:	$	1,901,744,084 -	$	2,165,993,366

Additional Costs:

Mitigation Cost:	$	82,870,000
Rest Area Cost:	$	28,640,000

Table HH-17

HYBRID 4/5A				
Construction Length:				141.48 mi
Driving Length:				142.57 mi
Construction Roadway Cost:	$	821,364,960 -	$	884,639,960
Construction Bridge Cost:	$	189,358,367 -	$	197,239,887
Subtotal Construction Cost:*	$	1,010,723,327 -	$	1,081,879,847
Design Engineering Cost:	$	49,660,310 -	$	53,046,832
Right-of-Way Engineering and Services Cost:	$	10,200,000 -	$	10,200,000
Subtotal Engineering Cost:	$	59,860,310 -	$	63,246,832
Right-of-Way Cost:	$	102,000,000 -	$	102,000,000
Total (Construction / Right-of-Way / Engineering) Cost:	$	1,172,583,637 -	$	1,247,126,679

Additional Costs:

Mitigation Cost:	$	71,220,000
Rest Area Cost:	$	28,640,000